WGTP - EPR Version 5 N&V with Stead notes , dated 10 September.pdf

Matthew Stead to: Sallyanne Everett 11/09/2017 09:09 AM

1 attachment

EPR Version 5 N&V with Stead notes, dated 10 September.pdf

Dear Sallyanne, the attached PDF reflects my current position on Noise and Vibration EPRs. Relevant notes are included where I have comments on the EPRs.

Regards

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<table>
<tr><th>EES Evaluation Objective</th><th>Applicable Legislation and Policy</th><th>Performance Objective</th><th>EPR Code</th><th>Environmental Performance Requirement</th><th>Project Phase</th><th>Notes</th></tr>
<tr><td colspan="7">Noise and Vibration</td></tr>
<tr><td>Health, amenity and environmental quality – to minimise adverse air quality, noise and vibration effects on the health and amenity of nearby residents, local communities and road users during both construction of the works and operation of the West Gate Tunnel Project</td><td></td><td>To minimise traffic noise impacts of West Gate Tunnel Project and local roads</td><td>NVP1A</td><td>Traffic noise limits
Design and construct the works to meet the following limits on traffic noise levels.
<table><tr><th>Aspect</th><th>External Traffic Noise Levels</th></tr><tr><td>External traffic noise levels</td><td>a External traffic noise levels from the freeway* and Local Roads+ at Category A Buildings and Category B Buildings^ facing the traffic noise, being those adjacent to or with a direct line of sight to the freeway*, must be no greater than:
i 63dB(A) $L_{10(18h)}$ measured between 6am and midnight for Category A Buildings; and
ii 63dB(A) $L_{10(12h)}$ measured between 6am and 6pm for Category B Buildings; and
b External traffic noise levels from the freeway* and Local Roads+ at Category A Buildings and Category B Buildings^ which do not fall within paragraph (a) above and which are adjacent to an identified section of Local Road+, must be no greater than the predicted traffic noise level under a ‘no project’ scenario. The ‘no project’ scenario must also assume that the road traffic noise attributable to the West Gate Freeway (without the project) is:
• 63dB(A) $L_{10(18h)}$ measured between 6am and midnight for the relevant Category A Buildings; and
• 63dB(A) $L_{10(12h)}$ measured between 6am and 6pm for the relevant Category B Buildings.</td></tr><tr><td>Applies at</td><td>The noise criteria in paragraphs (a) and (b) above are to apply to the lowest habitable level of Category A Buildings and Category B Buildings existing and occupied or capable of being occupied at the time of announcing the design on 2 April 2017.
In some cases off-site noise attenuation may be required to meet the noise criteria at any Category A or Category B Building. This may include implementation of noise attenuation measures in consultation with the owner of the relevant building to ensure that an equivalent internal level of attenuation is provided ~~internal~~ to the building.</td></tr></table></td><td>Detailed design, construction</td><td>Stead had a comment about defining which buildings (existing or approved) the EPR applies to.
He also had a further comment about the process for achieving the off-site attenuation outcome</td></tr>
<tr><td></td><td></td><td></td><td></td><td>* Freeway means the primary road connecting the West Gate Freeway (from</td><td></td><td></td></tr>
</table>

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				the M80 interchange) with the Port of Melbourne, CityLink and the city to be constructed as a result of the Project and excludes:
				• The sections of the West Gate Freeway east of the Williamstown rail line; and
				• The sections of the Project which comprise widening of arterial roads, but includes:
				  • The Dynon Road eastbound exit ramp and Dynon Road westbound entry ramp to the western abutment of the existing Dynon Road bridge over the railway lines; and
				  • The Wurundjeri Way Extension from Dynon Road to the point at which the elevated section of the road ties into Wurundjeri Way south of Dudley Street.
				+ Local Road means
				• The sections of Grieve Parade, Millers Road, Williamstown Road, Hyde Street, MacKenzie Road, Simcock Avenue and Dynon Road which extend 100 metres from the interchange of the relevant road with the Freeway; and
				• The sections of Footscray Road between the intersection of Footscray Road with the Footscray Road ramps and the Sims Street loop intersection with Footscray Road.
				^ Category A Buildings and Category B Buildings means
				• Category A Buildings: - Residential dwellings, aged persons homes, hospitals, motels, caravan parks and other buildings of a residential nature
				• Category B Buildings: - Schools, kindergartens, libraries and other noise-sensitive community buildings		

			NVP1B	**Traffic noise reduction at open space** Construct noise barriers to reduce noise levels at the following open space areas: • Crofts Reserve: extend the 8.25 metre high barrier on the south of the freeway, to the west for approximately 85 metres • McIvor Reserve: extend the 8.75 metre high barrier opposite McIvor Reserve, on the north side of the freeway, to the west for approximately 150 metres • Hyde Street Reserve: a 4.5 metre high noise barrier along the Hyde Street off ramp and shared use path adjacent to the Hyde Street Reserve for approximately 440 metres.	Detailed design, construction	
			NVP 1C~~A~~	**Operational noise limits** ~~The~~Traffic noise ~~barriers~~ mitigation measures must be maintained to ~~continue to meet~~ ensure that the traffic noise levels in NVP1A are not exceeded for 20	Operation	

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				years after opening of the freeway for the same sensitive receptors used at the time of the design.		
			NVP2	**Traffic noise monitoring** Traffic noise must be measured prior to and upon opening of the Freeway and during operation of the freeway, in accordance with the VicRoads Traffic Noise Measurement Requirements for Acoustic Consultants – September 2011, to verify conformance with the external traffic noise performance requirements set out in NVP1A above. Remedial action must be taken as soon as practicable in the event that the measured traffic noise levels demonstrate that the external traffic noise performance requirements set out in NVP1A are not met.	Pre-operation Operation	Stead notes different traffic volumes at opening and during operation

		Manage surface construction noise and vibration to protect amenity	NVP3	**Construction noise, vibration management, and monitoring**
				Prepare and implement a Construction Noise and Vibration Management Plan (CNVMP) in accordance with the limits and methodologies outlined in the Noise and Vibration EPRs.
				The CNVMP must be informed by monitoring and modelling undertaken by a suitably qualified acoustic and vibration consultant prior to the construction works and include (but not be limited to) the following:
				A. **Noise and vibration management levels**
				• The construction noise, vibration and regenerated noise targets as defined in EPRs NVP4, 6, 7, 8
				• Updated noise and vibration modelling of the noise and vibration impacts
				B. **Noise and vibration mitigation measures**
				• Identification of sensitive receptors potentially impacted by the construction stage of the Project
				• Identification of the scheduling, duration, activities and equipment with the potential to generate airborne noise or surface vibration impacts at the identified sensitive receptors
				• Implementation of construction noise and ~~surface~~ vibration ~~limits~~targets including management measures, where practicable to achieve these targets such as:
				  • Scheduling
				  • Measures to manage night works
				  • Vehicle and traffic management related to any relevant traffic management plan prepared under EPR TP3
				  • Temporary structures to attenuate noise impacts at the tunnel portals if required to achieve Noise and Vibration EPRs.
				• Detail of practicable measures that will be adopted to manage noise and vibration impacts that exceed the targets or values set out in the EPRs
					Pre-construction, construction	Stead recommends a section in the CNVMP on unavoidable works.

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				and CNVMP including: • Engagement and notification measures • Off site measures (eg temporary relocation or respite offers) ~~A.~~C. **Vibration** ~~• Updated noise and vibration modelling of the noise and vibration impacts~~ • Procedures for condition surveys to be undertaken, with the prior approval of the relevant property owner and/or occupier, for property, land, ground and infrastructure that is reasonably accessible and that may be affected by the project activities • Any alternative vibration guideline values identified under EPR NVP7 (refer Note 2 of NVP7). D. **Blasting** • If blasting is proposed, the values and management measures as defined in EPRs NVP 5, 12 and 13. E. **Monitoring** • Noise and vibration monitoring commitments (including real time monitoring in high risk areas) and response protocols for managing noise complaints and remedial action (with reference to procedures required by EPR EMP4) ~~• Detail of practicable measures adopted to manage noise and surface vibration impacts that exceed the targets set out in the CNVMP~~ F. **Community consultation** • Details of the communication plan to be adopted throughout construction as part of SP2 including any specific measures related to particular locations or activities • Detail of the complaints management system for noise complaints, consistent with the requirements under EPR EMP4.		
			NVP4	**Construction Noise Targets** **1 ~~Highly~~ Sensitive ~~A~~areas (non-residential)** For ~~Highly S~~sensitive ~~Areas~~land uses (based on AS/NZS 2107:~~2000~~2016) implement management actions if construction noise is predicted to or does exceed the internal and external noise levels below, and a noise sensitive receptor is adversely impacted. If construction exceeds the noise levels below: • Consider the duration of construction noise • Consider the existing ambient noise levels • Consult with the owner or operator of the noise sensitive receptor	Construction	

<table>
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<tr><td></td><td></td><td></td><td></td><td>
Consider any specific acoustic requirements of land uses listed below
To determine whether a noise sensitive receptor is adversely impacted.
<table>
<tr><th>Land use</th><th>Construction noise management level, L_{Aeq} (15 min) (applies when properties are in use)</th></tr>
<tr><td>Classrooms in schools and other educational institutions</td><td>Internal noise level 45 dB(A)</td></tr>
<tr><td>Places of worship</td><td>Internal noise level 45 dB(A)</td></tr>
<tr><td>Active recreation areas characterised by sporting activities and activities which generate their own noise, making them less sensitive to external noise intrusion</td><td>External noise level 65 dB(A)</td></tr>
<tr><td>Passive recreation areas characterised by contemplative activities that generate little noise and where benefits are compromised by external noise intrusion, for example reading, meditation</td><td>External noise level 60 dB(A)</td></tr>
<tr><td>Community centres</td><td>Depends on the intended use of the centre. Refer to the recommended “maximum” internal levels in AS/NZS 2107:2016 for specific uses.</td></tr>
<tr><td>Industrial premises</td><td>External noise level 75 dB(A)</td></tr>
<tr><td>Offices, retail outlets</td><td>External noise level 70 dB(A)</td></tr>
<tr><td>Other noise sensitive land uses as identified in AS/NZS 2107:2016</td><td>Refer to the noise levels in AS/NZS 2107:2016 for specific uses.</td></tr>
</table>
</td><td></td><td></td></tr>
<tr><td></td><td></td><td></td><td></td><td>
2 Residential dwellings
For residential dwellings, implement management actions if construction noise is predicted to or does exceed the noise targets in EPA Victoria Publication 1254 or the daytime management levels specified for noise at residences during recommended standard hours in Part 4.1.1 of the NSW Interim Construction Noise Guidelines (ICNG) with the hours amended to correspond to the EPA Victoria Publication 1254 hours as shown in the table below.
<table>
<tr><th>Time of day</th><th>Construction noise management level, L_{Aeq} (15 min) (applies when properties are in use)</th></tr>
</table>
</td><td></td><td></td></tr>
</table>

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<table>
<tr><td>7am–6pm Monday to Friday
7am–1pm Saturday</td><td>Noise affected
Background LA90+10dB
Source: NSW ICNG Chapter 4.1.1 Table 2, page 12</td></tr>
<tr><td>7am–6pm Monday to Friday
7am–1pm Saturday</td><td>Highly noise affected
75 dB(A)
Source: NSW ICNG Chapter 4.1.1 Table 2, page 12</td></tr>
<tr><td>6pm–10pm Monday to Friday
1pm–10pm Saturday
7am–10pm Sunday and public holidays</td><td>Noise level at any residential premises not to exceed background noise (L_{A90}) by:
• 10 dB(A) or more for up to 18 months
• 5 dB(A) or more after 18 months
Source: EPA Publication 1254 Section 2</td></tr>
<tr><td>10pm–7am Monday to Sunday</td><td>Noise inaudible within a habitable room of any residential premises
Source: EPA Victoria Publication 1254 Section 2</td></tr>
</table>
Notes
1 The noise affected level represents the point above which there may be some community reaction to noise.
2 The highly noise affected level represents the point above which there may be strong community reaction to noise.
3. For the purpose of predictive modelling, the noise level for consideration of inaudibility should be based on background +0
</td><td></td><td></td></tr>
<tr><td></td><td></td><td></td><td>NVP5</td><td>Blasting trials and assessment
Where blasting is proposed, a series of initial trials at reduced scale must be conducted prior to production blasting to determine site-specific blast response characteristics and to define allowable blast sizes to meet air blast overpressure and ground vibration limits. If blasting is required, an assessment of the potential noise and vibration impacts, and a strategy to minimise and manage those impacts must be prepared, including preparation of an appropriate community information program.</td><td>Construction</td><td></td></tr>
<tr><td></td><td></td><td>Manage construction vibration and regenerated</td><td>NVP6</td><td>Construction vibration targets (amenity)
Implement management actions if the following guideline target levels for continuous vibration from construction activity to protect human comfort of occupied buildings (including heritage buildings) are not achieved (levels are</td><td>Construction</td><td></td></tr>
</table>

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<tr><td></td><td></td><td>noise impacts to protect amenity</td><td></td><td>calculated from the British Standard BS6472-1:2008).
<table>
<tr><th></th><th colspan="4">Vibration Dose Values (m/s$^{1.75}$)</th></tr>
<tr><th></th><th colspan="2">Day (7am to 10pm)</th><th colspan="2">Night (10pm to 7am)</th></tr>
<tr><th>Type of space occupancy</th><th>Preferred Value</th><th>Maximum Value</th><th>Preferred Value</th><th>Maximum Value</th></tr>
<tr><td>Residential</td><td>0.2</td><td>0.4</td><td>0.1</td><td>0.2</td></tr>
<tr><td>Offices, schools, educational institutions, places of worship</td><td>0.4</td><td>0.8</td><td>0.4</td><td>0.8</td></tr>
<tr><td>Workshops</td><td>0.8</td><td>1.6</td><td>0.8</td><td>1.6</td></tr>
</table>
Notes
1 The Guideline Targets are non-mandatory; they are goals that should be sought to be achieved through the application of practicable mitigation measures. If exceeded then management actions would be required
2 The VDVs may be converted to PPVs within a noise and vibration construction management plan. </td><td></td><td></td></tr>
<tr><td></td><td></td><td></td><td>NVP7</td><td>Construction vibration targets (structures)
Construction vibration targets for structures are summarised in the tables below.
Guideline values for the vibration velocity to be used when evaluating the effects of short term vibration on structures.
<table>
<tr><th></th><th colspan="3">Guideline values for velocity (mm/s)</th><th></th></tr>
<tr><th></th><th colspan="3">Vibration at the foundation at a frequency of</th><th>Vibration at horizontal plane of highest floor</th></tr>
<tr><th>Type of structure</th><th>1 to 10 Hz</th><th>10 to 50 Hz</th><th>50 to 100 Hz*</th><th>All frequencies</th></tr>
<tr><td>1. Buildings used for commercial purposes, industrial buildings, and buildings of similar design</td><td>20</td><td>20 to 40</td><td>40 to 50</td><td>40</td></tr>
<tr><td>2. Dwellings and buildings of</td><td>5</td><td>5 to 15</td><td>15 to 20</td><td>15</td></tr>
</table></td><td></td><td></td></tr>
</table>

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<table>
<tr><td>similar design and/or occupancy</td><td></td><td></td><td></td><td></td></tr>
<tr><td>3. Structures that, because of their particular sensitivity to vibration, cannot be classified under lines 1 and 2 and are of intrinsic value (eg. Heritage buildings)</td><td>3</td><td>3 to 8</td><td>8 to 10</td><td>8</td></tr>
</table>
*At frequencies > 100 Hz, the values given in this column may be used as a minimum

Notes
1 Vibration levels marginally exceeding those vibration levels in the table would not necessarily mean that damage would occur and further investigation would be required to determine if higher vibration levels can be accommodated without risk of damage.
2 For civil engineering structures (e.g. with reinforced concrete constructions used as abutments or foundation pads) the values for Type 1 buildings may be increased by a factor of 2
3 Short-term vibration is defined as vibration which does not occur often enough to cause structural fatigue and which does not produce resonance in the structure being evaluated.
</td><td></td><td></td></tr>
<tr><td></td><td></td><td></td><td></td><td>
Guideline values for the vibration velocity to be used when evaluating the effects of long term vibration on structures.
<table>
<tr><th>Type of structure</th><th>Guideline values for velocity (mm/s) Vibration at horizontal plane of highest floor All frequencies</th></tr>
<tr><td>Buildings used for commercial purposes, industrial buildings, and buildings of similar design</td><td>10</td></tr>
<tr><td>Dwellings and buildings of similar design and/or occupancy</td><td>5</td></tr>
<tr><td>Structures that, because of their particular sensitivity to vibration, cannot be classified under lines 1 and 2 and are of intrinsic value (eg. Heritage buildings)</td><td>2.5</td></tr>
</table>
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<tr><td></td><td></td><td></td><td></td><td>Notes:
1 Vibration levels marginally exceeding those in the table would not necessarily mean that damage would occur and further investigation would be required to determine if higher vibration levels can be accommodated without risk of damage
2 <s>Limits</s> Targets in the above table may need to be adjusted where deemed necessary and/or appropriate to protect the structural integrity of structures based on <s>following</s> a pre-construction condition survey and/or modelling
3 Long-term vibration relates to events that may result in a resonant structural response.

Implement management actions if, due to construction activity, the DIN 4150.3 Guideline Targets for structural damage to buildings (for short-term vibration or long-term vibration) are not achieved.</td><td></td><td></td></tr>
<tr><td rowspan="2"></td><td rowspan="2"></td><td></td><td>NVP8</td><td>Ground-borne (internal) noise targets
Implement management actions as determined in consultation with potentially affected land owners to protect amenity at residences where the following ground borne noise guideline targets are exceeded during construction.
<table><tr><th>Time of Day</th><th>Internal noise level measured at the centre of the most affected habitable room</th></tr><tr><td>Evening (6pm to 10pm)</td><td>L_{Aeq} (15 minute) = 40dBA</td></tr><tr><td>Night (10pm to 6am)</td><td>L_{Aeq} (15 minute) = 35dBA</td></tr></table>Notes
1 Levels are only applicable when ground borne noise levels are higher than airborne noise levels.
2 Management actions include community consultation to determine acceptable level of disruption and provision of respite accommodation in some circumstances.</td><td>Construction</td><td></td></tr>
<tr><td>To manage construction vibration to protect utility assets</td><td>NVP9</td><td>Utility asset protection
Prior to construction undertake condition assessments of above and below ground utility assets and establish construction vibration limits in consultation with asset owners to maintain asset integrity. Where construction vibration limits are not agreed with the asset owner, the guideline values in the table below apply.</td><td>Pre-construction, construction</td><td></td></tr>
</table>

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<table>
<tr><th>Pipe Material</th><th>Guideline values for velocity measured on the pipe</th></tr>
<tr><td>Steel (including welded pipes)</td><td>100mm/s</td></tr>
<tr><td>Clay, concrete, reinforced concrete, pre stressed concrete, metal (with or without flange)</td><td>80 mm/s</td></tr>
<tr><td>Masonry, plastic</td><td>50 mm/s</td></tr>
</table>
Notes
1 These values may be reduced by 50% when evaluating the effects of long-term vibration on buried pipework
2 It is assumed pipes have been manufactured and laid using current technology.
Monitor vibration limits during construction to demonstrate compliance with agreed vibration limits. Identify contingency measures to be implemented if limits are not met. Where necessary rectify any defects that are attributable to the Project.
</td><td></td><td></td></tr>
<tr><td></td><td>SEPP N-1 – Control of Noise from Commerce, Industry and Trade</td><td>To minimise noise impacts of the tunnel ventilation system</td><td>NVP10</td><td>Tunnel ventilation system noise design
Design and implement the tunnel ventilation system in accordance with the Works Approval and to achieve compliance with State Environment Protection Policy (Control of Noise from Commerce, Industry and Trade) No. N-1 (SEPP N-1) ~~and in accordance with the Works Approval~~. Provide detailed design to the satisfaction of EPA Victoria prior to commencement of the works permitted by the Works Approval.</td><td>Detailed design. operation</td><td>Stead recommends that this apply to other noise sensitive buildings, if relevant.</td></tr>
<tr><td></td><td></td><td></td><td>NVP11</td><td>Tunnel ventilation system noise monitoring
Measure noise from the tunnel ventilation system on commencing road operation and monitor noise from the tunnel ventilation system for up to five years post opening of the Freeway, or as agreed with EPA Victoria, to verify compliance with State Environment Protection Policy (Control of Noise from Commerce, Industry and Trade) No. N-1 (SEPP N-1). Identify contingency measures to be implemented if noise level targets are not met.</td><td>Operation</td><td></td></tr>
<tr><td></td><td></td><td>Manage construction blasting impacts to protect amenity</td><td>NVP12</td><td>Amenity – Blast Vibration
Implement management actions if the following vibration values are not achieved. Blasting activities must comply with Australian Standard AS2187.2-2006, Explosives – Storage and use Part 2 – Use of explosives for all blasting.</td><td>Construction</td><td></td></tr>
</table>

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<table>
<tr><th>Category</th><th>Type of blasting operations</th><th>Peak component particle velocity (mm/s)</th></tr>
<tr><td>Sensitive site</td><td>Operations lasting longer than 12 months or more than 20 blasts</td><td>5mm/s for 95% blasts per year
10mm/s maximum unless agreement is reached with the occupier that a higher limit may apply</td></tr>
<tr><td>Sensitive site</td><td>Operations lasting less than 12 months or less than 20 blasts</td><td>10mm/s maximum unless agreement is reached with occupier that a higher limit may apply</td></tr>
<tr><td>Occupied non-sensitive sites such as factories and commercial premises</td><td>All blasting</td><td>25mm/s maximum value unless agreement is reached with occupier that a higher limit may apply. For sites containing equipment sensitive to vibration, the vibration should be kept below manufacturer’s specification or levels that can be shown to adversely affect the equipment operation</td></tr>
</table>
Note
1 Sensitive site includes houses and low rise residential buildings, theatres, schools and other similar buildings occupied by people.
</td><td></td><td></td></tr>
<tr><td></td><td></td><td></td><td>NVP13</td><td>
Amenity – Blast Overpressure
Implement management actions if the following overpressure values are not achieved. Blasting activities must comply with Australian Standard AS2187.2-2006, Explosives – Storage and use Part 2 – Use of explosives for all blasting.
<table>
<tr><th>Category</th><th>Type of blasting operations</th><th>Peak Overpressure Value (dBL)</th></tr>
<tr><td>Sensitive Site</td><td>Operations lasting longer than 12 months or more than 20 blasts
Operations lasting less than</td><td>115 dBL for 95% blasts per year. 120dBL maximum unless agreement with occupier that a higher limit may apply
120dBL for 95% blasts per year. 125 dBL maximum unless agreement with occupier that a</td></tr>
</table>
</td><td>Construction</td><td></td></tr>
</table>

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					12 months or less than 20 blasts	higher limit may apply		
				Occupied non-sensitive sites such as factories and commercial premises	All blasting	125 dBL maximum value unless agreement is reached with occupier that a higher limit may apply. For sites containing equipment sensitive to vibration, the vibration should be kept below manufacturers specification or levels that can be shown to adversely affect the equipment operation		
				Note *1 Sensitive site includes houses and low rise residential buildings, theatres, schools and other similar buildings occupied by people.*				